JANUARY, 1951

Traffic Engineering

Official Publication of the Institute of Traffic Engineers

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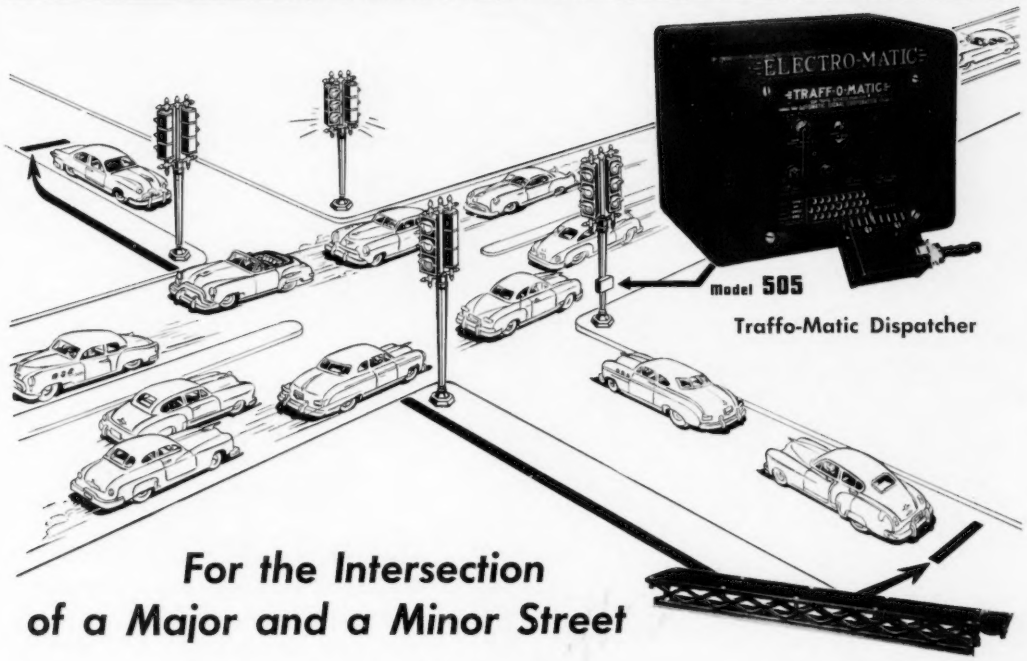

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Traffic Engineering

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

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COVER: Modern signing on the Hollywood Freeway in Los Angeles. Each panel on this sign is 12′ long and 40″ deep. Note article by Skiles.

Traffic Engineering is that phase of engineering which deals with the planning and geometric design of streets, highways, and abutting lands, and with traffic operation thereon, as their use is related to the safe, convenient, and economic transportation of persons and goods.

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Frankly Speaking

As the Institute of Traffic Engineers enters its 20th year as a technical organization, it is with justifiable pride that we look back on the accomplishments made during those years in advancing our profession.

When, on January 20, 1931, the Constitution and By-Laws were adopted only a very few of our municipalities employed a full-time traffic engineer. Now more than sixty per cent of the cities over 100,000 population in this country have traffic engineering departments, headed by qualified traffic engineers. Yes, for a relatively short period of time, this is a tremendous accomplishment!

As we all know, there have been other extremely satisfactory accomplishments as well: the *Traffic Engineering Handbook, Traffic Engineering* magazine and standard specifications. By far the most outstanding accomplishment, however, is the growth in the number of cities realizing that—like sanitation and education—the responsibility for traffic operations and control in competent and well-trained hands is a *city* responsibility.

However, the goal has not by any means been reached. More of our cities, particularly those over 100,000 population, should add traffic engineering to their "City Organization Charts." The Institute must continue to sell traffic engineering and convince city officials, particularly in cities of the size mentioned above, that it is the only effective approach to their problems of engineering relating to traffic operations and control.

Yet, there is a more serious problem. What about traffic engineering in small cities? How can the Institute develop greater interest in these towns and villages? How can the Institute convince municipal engineers that they must assume this responsibility because it is so closely related to city engineering activity? How can the Institute assist or advise in training such individuals in the fundamentals of traffic engineering? Basically, of course, we must first decide: Is this the Institute's responsibility?

None of us can seriously question that the need for traffic engineering in smaller cities is a serious problem—*our* problem!

We all could help by first seeing to it that these city engineers have the new *Traffic Engineering Handbook*, are receiving *Traffic Engineering* magazine and have the various standard specifications. We can urge their attendance at the various State Traffic Engineering Conferences, such as those recently conducted in Missouri, Illinois and California.

Where a city engineer spends part of his time on traffic engineering, and has done so for a period of years, he should be invited to make application for membership. And by all means, he should be a member of a local ITE chapter if he resides in a chapter area.

Yes, we have accomplished much, but a great deal of selling and public relations work lies ahead. We can help the fellow in the "smaller cities" in many ways and we must continue to develop and assume even greater responsibilities as new situations arise.

Harry Porter Jr.

Secretary-Treasurer

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Illuminated Signs for Freeways in the Los Angeles Area

By G. W. Skiles
Assistant Traffic Engineer, California Division of Highways, District VII[1]

WITH the advent of the postwar freeway program in California, the need for directional signs suitable to the characteristics of these modern facilities was recommended. Due to the wide variance between freeway characteristics and the features of the ordinary street or highway, it was also realized that the types of signs and the locations employed must necessarily be entirely different from the usual applications.

For roadways expected to carry average daily traffic volumes as high as 12,000 vehicles per lane, efficient design requires that points of egress be located many blocks apart, even when operating through populous areas. In addition, most of the planned freeways will become units of major interstate and intrastate highways and will therefore carry large numbers of out-of-town vehicles. These features, together with the relatively high operating speeds, require that the motorist be made aware of turnout locations sufficiently in advance to eliminate the necessity for rapid deceleration or for lane-changing maneuvers dangerously near the interchange.

Before the first freeway units were placed in operation traffic engineers realized that, with these roadway design features and traffic characteristics, efficient operation could not tolerate the confusion and accident hazard that would result without proper identification of the outlets. The Traffic Department of the Division of Highways, under Traffic Engineer J. C. Young, consequently established the general requirements to be fulfilled by a freeway directional signing system. Working in conjunction with the traffic departments of the various Districts, designs were then developed for signs suitable to the characteristics of the freeways within those Districts.

Under the direction of District Traffic Engineer A. L. Hutchison, a directional sign program has been developed for the freeways in the Los Angeles metropolitan area which, while fulfilling the general requirements established on a Statewide basis, embodies many features developed primarily to suit local conditions.

General Design Considerations

The directional signing system employed in the Los Angeles area consists, in general, of reflectorized advance warning signs normally located one-quarter mile in advance of the point of egress; a large-size exterior illuminated sign positioned near the beginning of the decelerating lane, usually about 400 feet from the point of egress; and a reflectorized sign placed near the nose of the off-ramp island. Where space permits, the one-quarter mile advance signs are preceded by an additional lane direction sign.

Daytime Sign
Above photograph illustrates daytime legibility of sign on the Santa Ana Freeway in Los Angeles County. Panel is 22′ long and 60″ deep.

The advance warning signs and the signs located at the off-ramp island are similar in design, employing 8-inch white reflectorized letters on a black background. These advance warning signs, first used on freeways in the San Francisco Bay area, have proved especially effective in lane distribution maneuvers in advance of the interchange area.

The most important, and the most unusual, element of the directional sign system is the large, exterior illuminated sign located near the beginning of the deceleration lane. Employing white lower case letters on a black background, and mounted 17 feet above the roadway, these signs present a distinctive appearance and can be easily read from any lane in the direction of travel.

The choice of letter type and color was determined from limited observation comparisons with full size models under both daylight and night-time conditions. It was found in these studies that lower case letters presented an advantage in word recognition value; and when viewed at a distance while illuminated, there was less tendency for the letters to merge.

The use of white letters on a black background was initially determined because of the pronounced advantage in legibility when illuminated, primarily because of the low background brightness as compared with the letter brightness, but also because of the reduction in glare. This color combination was subsequently found to be advantageous in the daytime as well because the 17-foot mounting height places the sign against a sky background and the entire sign panel is consequently clearly defined.

In establishing the latter sizes to be used, cognizance was

[1]District VII is composed of Los Angeles, Orange and Ventura Counties. Mr. P. O. Harding, Assistant State Highway Engineer is in charge of the District. Mr. M. E. Cessna, District Engineer, is in charge of Planning and the Traffic Department is one of his responsibilities.

taken of the fact that, in order to be totally effective, signs must be designed not for the average motorist or for adequate visibility under normal weather conditions, but for the driver with poor vision or slow reflexes and for adverse weather conditions. The letter sizes chosen for the first installations, 8-inch lower case and 12-inch upper case, were originally thought adequate, considering the location normally employed for these signs. Following these installations, however, it was found that even larger letters would be desirable. The sizes have consequently been increased to 12-inch lower case and 18-inch upper case on the latest installations.[2]

Observation of the early signs also indicated the desirability of increased background area. From the 22-inch and 40-inch depths for single line and two line panels, respectively, the panel area was increased on subsequent installations until the present standard depths of 40 inches and 60 inches were developed. These depths are now being used, with few exceptions, for all standard signs.

In addition to the advantages in legibility, the combination of color, lower case letters, overhead mounting and large size all serve to present a distinctive appearance and to make the sign readily noticeable.

The sign panels are made of light-gauge porcelain enameled sheet steel and are mounted on a framework fabricated from standard structural angle. At the top and bottom of the frame are a cap and collar fabricated from structural plate and short sections of standard pipe and designed for slip fit over the top of the pole. The frame and standard are fabricated as separate units to facilitate transportation. Shop fabrication includes the drilling and tapping of all holes used in mounting the lighting fixtures, sign panels and other attachments.

Erection is relatively simple, with the frame being set over the top of the standard either on the ground or after the standard is set. Field welding is kept at a minimum, with but three welds running the circumference of a pole necessary to secure the frame. The completed assembly is mechanically rigid. With the panel in place, the sign is designed to withstand a wind loading in excess of 60 miles per hour.

The pole is fabricated from swaged sections of 10-inch, 8-inch and 6-inch standard pipe. The length of the top section is varied with the depth of sign panel to maintain 17 feet clearance to the bottom of the panel.

Solving the Illumination Problem

During the preliminary development stages of the illuminated signs, various types of lighting were considered, varying from floodlighting methods to the use of gaseous tube letters. Following studies of legibility of the various methods that had been used elsewhere, field tests were made with a number of different light sources and with a variety of fixtures. From these comparisons, it was evident that the uniform illumination obtained with fluorescent sources had a distinct advantage in visibility. Economic considerations also favored this type of source, since the long lamp life and low power consumption result in low maintenance costs. Of the types of fluorescent lamps available, the new slimline tubes appeared particularly suitable, but it was also decided to include in the initial installations signs using cold cathode and instant-start sources.

Outdoor applications of fluorescent lamps have probably been more restricted by the lack of suitable fixtures than for any other single reason. The long light source does not lend itself to accurate control of the light output, thus eliminating the fluorescent source from consideration for many uses. For sign lighting applications, however, the fluorescent lamp is particularly adaptable, since with lamp lengths approximately equal to that of the sign panel horizontal control is not required and it is therefore necessary to control only the vertical light distribution.

To accomplish this purpose, it was at first considered necessary to use a fairly large reflector and provide additional control with a refractor lens. A fixture was consequently developed by a local manufacturer using four commercially available 6-inch by 12-inch refractor lenses continuously hinged to the fixture. It was then possible to use as many of these four-foot long fixtures as necessary to extend approximately the length of the sign.

With the relatively large size of this luminaire, 7¾ inches wide and 5¾ inches deep, the porcelain enameled inner surface acted as an efficient reflector and the results with this fixture were excellent. However, concurrent tests with slimline lamps in ordinary showcase type fixtures indicated that the additional cost of the more elaborate luminaire was not warranted unless the sign panel was to be in excess of five or six feet in depth. Some objection was also raised to the daytime shadow cast by the large fixture.

Consequently, in the original installation of 15 signs on the Santa Ana Freeway in Los Angeles, the large fixtures, using T-12 instant-start lamps, were installed on but one sign, and fixtures similar to the showcase type were installed on the balance. Cold cathode lamps were used on one of these signs and T-6 slimline lamps on the remainder. Because of its advantage in simplicity, the showcase type fixture has been used on all signs placed in operation since that time. The refractor fixture will be used, however, on especially large signs.

The shell for the showcase type fixture is formed from one-piece, No. 24-gauge stainless steel. An inner reflector is formed of paint grip steel and finished with baked enamel. The edges of the outer shell are crimped to carry the reflector and lamp sockets. The shell and reflector are shaped to provide a sharp light cutoff near the top of the sign and an even light distribution over the vertical surface. As presently used the shell is 2½ inches wide at the opening and 2⅝ inches deep. The fixture is supported by means of adjustable angle brackets attached to the top or bottom of the sign frame.

In order to facilitate lamp replacement and to minimize the number of lamps and ballasts carried in stock, only two sizes of slimline lamps are used in the Los Angeles District: 64-inch and 42-inch, T-6. It is possible to closely approximate the sign length with fixtures using combinations of these two sizes. Also, since two-lamp ballasts are used wherever possible, fewer ballasts are required for each sign. The lamps are normally operated at 300 milliamperes, although a few 200 ma. ballasts have been used. The ballasts are housed in a raintight, ventilated cabinet mounted on the rear of the sign frame.

Service conductors are carried underground to the standard. Since the signs are located near the beginning of interchange lighting systems, service is usually provided through

[2]The lower case height refers to the loop height of a lower case word; i.e., the height of the letters a, c, e, etc. In the alphabet used, the loop height is 2/3 the maximum height above the base line, or 2/3 the height of a capital letter.

Nighttime Sign
Typical example of excellent legibility with exterior illumination. Panel is 22' long and 40" deep.

series to multiple transformers from the constant current lighting circuit. This practice results in a considerable saving in service conduit and conductors and also eliminates the need for individual switching control. To allow isolation of the sign circuits, a fused safety service switch is mounted on the rear of the standard.

Although it is the practice in this District to locate the luminaire at the top of the sign, much attention has been given in other Districts, particularly in the Sacramento area, to the use of button-mounted fixtures. Such installations using open fixtures have been in operation for as long as 18 months, but a protective cover of glass or clear plastic is generally used.

This positioning has the advantages of eliminating daytime shadow and reducing reflected glare. Maintenance costs may be increased, however, by the necessity for periodic cleaning of the glassware.

Excellent results in light distribution have been obtained by using top and bottom mounted luminaires, particularly on the larger signs.

Lamp life on the illuminated signs has been excellent. Since the first 15 signs, using a total of 61 lamps, were placed in operation in April, 1949, there have been only nine lamp burnouts. Consequently, the majority of the 52 slimline lamps and all 6 of the instant-start lamps have exceeded their rated life of approximately 5,000 hours. There has been no reported failure of the cold cathode lamps. However, their operation has thus far exceeded but slightly over half the rated life of 10,000 hours.

Of the later signs, four have been in operation for eleven months and two others for six months each. Slimline lamps are used on all these signs, and there have been no lamp failures to date.

Some difficulty has been experienced with the slimline ballasts used on the first installations. While the failures have resulted from overheating in all cases, the cause of overheating has not been definitely determined.

Future Signing Program

To date, a total of 25 illuminated signs have been placed in operation on the freeways in this district, and 13 others are currently under contract. Included in the signs under contract are two types to be installed on the Hollywood Freeway in the City of Los Angeles which are substantially different from any previous installation.

One of these signs will be mounted on an existing reinforced concrete grade separation structure. This sign will be mounted on the outside girder face of the structure, directly over the freeway roadway. The frame, while similar to those used on pipe standards, is lighter in weight and is mounted on brackets secured to the bridge with expansion anchors. The slimline fixture will also be used on this sign. The ballast box and service switch are to be mounted on the girder face adjacent to the sign.

The second special sign will be installed on the Hollywood Freeway approach to the four-level grade separation area at the junction with the Arroyo Seco—Harbor Freeway. This sign will be mounted on a steel structure spanning the 48-foot roadway. Although the sign will at present be used as an advance warning of the temporary end of the freeway, the structure is designed to carry a panel 9 feet deep and approximately 40 feet long which will be placed when the remaining approaches to the interchange area have been constructed. It is planned to construct similar signs at each of the other three freeway approaches. The refractor lens fixtures will be used on these large signs and in order to obtain ample light coverage, 48-inch T-12 slimline lamps operated at 425 milliamperes will be employed.

Since the development of the new directional signs, it has been the practice to install the signs prior to the opening to traffic of any new section of freeway. Consequently, it has been impossible to determine their effect on accident rates on the newer freeways. Further, due to the advances in freeway design, particularly in the treatment of interchange facilities, it is impractical to compare accident records or traffic behavior on the new freeways with those on the older freeways. Such comparisons will be possible, however, when the modern signs have been installed on the older freeways as well.

It is believed that these studies and other investigations now being conducted will prove these directional signs to provide an effective contribution to traffic safety on freeways by eliminating driver hesitation and thereby reducing congestion and conflicting movements in the interchange areas.

Los Angeles Lets Contract for Big Underground Garage

Construction of a $5,000,000 parking garage under Pershing Square in Los Angeles is about to begin, with award of a Recreation and Park Commission contract to City Park Garage, Inc. The project, which has been discussed for a number of years, is scheduled for completion by the end of 1952. Designation of the garage as a possible bomb shelter is expected to eliminate difficulty in obtaining materials.

According to the specifications the park surface must be restored to its existing condition after construction is completed.

Toronto's Downtown Parking Survey

By Harry R. Burton (Assoc. Mem., ITE)
City Traffic Engineer, Toronto, Canada

THE City of Toronto, like all large North American cities, emerged from the war with its traffic fences in a very sad state of repair. The lethargy of the depressing 30's followed by the lessened traffic of the gas-rationed war period, with its preoccupied governing bodies and shortages of staff, contributed to a general let-down in plans and preparations for the postwar surge which was to follow. Parking lot operators were looking at half empty lots with uneconomic parking fees and parking space was gradually disappearing in the downtown area as more economic use was being found for the land, a process which unfortunately still continues.

Immediately following the war, congestion on downtown streets became very pronounced, with trucks and street car volumes at an all-time high. A good deal of curb parking had to be eliminated, adding to the shortage of parking space and arousing the ire of the downtown merchants. As a result it was decided in 1948 to make a thorough survey of parking habits and needs in an area of slightly over 400 acres, which has generally been considered to be the downtown area. The necessary funds were provided, two-thirds by City Council and one-third by the Toronto Transportation Commission, a publicly-owned body, which has acquired a wide-spread recognition as a progressive and efficient organization.

The first requirement was to determine the most suitable type and manner of survey and the scope to be covered. After study of a number of reports produced by other cities, it was decided to follow in a general way the system developed by the U. S. Bureau of Public Roads as outlined by Mr. R. H. Burrage at the annual meeting of the Institute held in Detroit in 1947, but with more attention being paid to the loading and unloading habits of trucks. A recommendation was then submitted to the Civic Administration to the effect that a consultant be engaged to conduct the survey, and make the report, but because of the desires of a number of local fact finding concerns it was decided to call for tenders and leave the general direction to the Traffic Engineer's Department. The lowest tender was under $27,000 submitted by the Elliott-Haynes Co. Ltd., a highly reputable firm which did a very comprehensive piece of work, but the heavy load of direction and control was placed on a staff already over-burdened with work. This could have had unfortunate results if a less competent firm had been the lowest tenderer and this procedure is not recommended unless the Department is adequately staffed to permit a full-time supervisor for the direction of the survey.

Survey Requirements

Prior to the calling of tenders, specifications were prepared covering the work to be performed and plans of existing parking facilities were brought up to date and attached to the specifications. It was decided that the tenderer would be required to contact block by block, all drivers parking or stopping to unload or load goods, between the hours of 8:00 A.M. and 6:00 P.M., Mondays to Fridays. The three basic questions to be asked were:

(1) Where did you come from?
(2) Where are you going?
(3) What is the purpose of your trip?

In addition, the location of the vehicle, the type, license number, time in and out were also recorded. The contractor was then required to prepare some twenty-four summaries, some of which involved many pages of figures. On completion all field records and a punched Hollerith card for each vehicle, were to be turned over to the Department. This in general composed the scope of the contractors work.

Simultaneously with the survey, the Department staff conducted a 7:00 A.M. to 7:00 P.M. cordon count on all streets entering the area. Similar cordon counts were available for the years 1928 and 1938, permitting a useful comparison of the trend in traffic flow.

A comparison of cordon counts and parking accommodation changes over the two decades is shown below.

I believe it may be assumed that the decrease in the number of parking spaces per 100 registered vehicles and the increased use of highways by trucks, as shown in the above table, may be accepted as a major force in the trend towards decentralization and the establishment of business areas in other locations.

In this city, traffic in July and August shows a marked decrease because of the holiday period. Also the last week in August and the first week in September is the period of the Canadian National Exhibition, which is held annually in Toronto and attracts an attendance of upwards of two and one-half million visitors in the two weeks, resulting in highly abnormal traffic conditions. It was therefore decided to conduct the survey in the seven weeks between the end of the Exhibition and the end of October. As it turned out only one day was lost because of bad weather and the field work was completed in five weeks. A total of 66,557 vehicles were recorded and it is gratifying to report that only in 167 cases was information refused, a fact which speaks well for the public relations work of the contractor and the smartness of the ladies who did the interviewing.

	Vehicles Entering		York County Registration		Parking Spaces per 100 Reg'd Cars	% of Registered Cars Entering
	Cars	Trucks	Cars	Trucks		
1928	43,500	14,500	95,849	17,107	11	45.4%
1938	67,700	20,300	147,342	21,953	12	45.9%
1948	67,700	26,300	182,625	40,800	7.7	36.1%

Survey of Findings

The following is a general summary of the parking facilities within the area and the extent to which they were found to be used:

	Spaces	Use 8 A.M.-6 P.M.
Curb (legal)	3,694)	41,372
Curb (illegal)	6,436)	
Public lot	8,834	10,502
Private lot	3,756	6,110
Public garage	2,591	2,570
Private garage	618	859
Laneway (illegal)		5,144
Total legal spaces	19,493	66,557

It is obvious from the above that curb space occupancy is nearly all short time parking while the off-street space is mostly long time parking.

The purpose for which the 66,557 vehicles were parked was found to be as shown below.

	Pass. Car	Truck	Taxi Bus.	Motor-cycle	Horse-drawn	Other	Total
Work	12,024	2,375	385	57	35	40	14,916
Business	13,938	2,097	101	33	34	35	16,238
Shopping	5,138	588	42	16	7	11	5,802
Sales & Service	4,000	16,965	641	102	250	49	22,007
Other	5,756	1,431	162	29	20	29	7,427
Refused	147	13	2	—	2	3	167
	41,003	23,469	1,333	237	348	167	66,557

From this analysis two important facts may be gleaned. Firstly, that the use of motor vehicles for shopping purposes (5802 per diem) is probably of less importance to the downtown merchant than has been claimed. This point is further emphasized by the fact that 2603 of the drivers intimated that their destination was one of the two large stores which dominate the area and both of which operate large off-street facilities. Secondly, the fact that trucks parked for loading and unloading constitute the largest parking use, points up the importance of off-street loading facilities. The peak demand for parking space was found to be between 3:00 and 3:30 P.M., amounting to little over 17,000 vehicles of all kinds and in various types of facilities. The type of vehicles and the purpose for which they were parked during this peak period were as follows:

	Work	Business	Shopping	Sales & Service	Other	Total
Cars	7,904	3,336	1,246	803	1,043	14,332
Trucks	390	263	41	1,706	194	2,594
Other	85	23	12	107	41	268
	8,379	3,622	1,299	2,616	1,278	17,194

Assuming that vehicles parked for the purpose of work may be considered long time parking, it will be noted that the former used 8,379 spaces and the latter 8,815 spaces. From the latter however, must be deducted the number of 2,616 vehicles used for sales and service which do not come within the definition of parking for storage purposes. This leaves the peak period demand for short time space at 6,199 and the total peak period demand at 14,578.

Future Parking Considerations

In considering future parking space requirements and the steps to be taken to meet those requirements two main factors must be anticipated, firstly, the increased demand for parking space that may be anticipated during the next ten years and secondly, the extent to which existing parking facilities may be considered permanent. The first involves several important considerations:

(a) Increased access highway capacities
(b) Increased commercial development
(c) Increased automobile registration
(d) Increased population

If parking facilities can be provided at reasonable cost with convenient access and if the above mentioned increases materialize as anticipated, a 50% increase in demand would appear to be entirely within reason, which with a necessary 10% allowance for vacancies would require about 24,000 spaces made up of about 14,000 long time and 10,000 short time.

A study of the second factor, the permanency of existing parking facilities gives rise to the following summary:

	Present	Future
Curb	3,694	2,539
Public lot	8,834	4,552
Public garage	2,591	2,591
Private lot	3,756	3,756
Private garage	618	618
	19,493	14,056

Comparing future capacity of existing facilities of about 14,000 spaces with the estimated future demand of 24,000 spaces indicates that provision should be made for about 10,000 additional off-street spaces.

The City Planning Board has been requested by the Civic Administration to submit recommendations as to the procedure to be followed in dealing with this problem and to select suitable sites for both long time and short time parking facilities. Studies with regard to operating costs and other details are proceeding.

Black Most Popular Color for Cars

Despite reports by various individual companies from time to time that colors other than black are not popular with their buyers, on a coast-to-coast over-all basis, black is still the most popular color demanded by automobile buyers, according to the Automobile Manufacturers Association. In certain sections of the country, principally the far west, brighter colors are more popular than black, but in other areas, such as New England and the midwest, black is the most popular color by a considerable percentage. Two-tone cars are increasing in popularity, and one company reports that 20 per cent of its total output is devoted to two-tones.

The Effectiveness of Flashing Beacons

By J. Ernest Warinner
Traffic Supervisor, Virginia Department of Highways

INTERSECTIONAL control on through highways within communities has long been a problem confronting state highway officials. As speeds have increased on the highways, the problem has become more and more important. Pleas from the citizens and officials of communities to slow down traffic and provide some sort of protection at the intersections are directed to highway officials. Most traffic engineers, for good reasons, are reluctant to install STOP & GO traffic signals if it can be avoided. Consequently some other form of control is sought, and frequently the flashing beacon is utilized. The effectiveness of a flashing beacon in accomplishing the desired end under such circumstances is the subject of the investigation reported here.

The theory behind the use of the flashing beacon as a traffic control device lies in the attention-getting property of a flashing light and in the conventional use of yellow and red as caution or danger signals. Psychologically, persons are conditioned to any stimulus by a consistent association of the stimulus with an idea or situation. Through the use of yellow and red in traffic signals to mean caution and stop respectively, drivers become conditioned to these colors and their meaning. That is, they associate a yellow signal with caution and the red signal with stop. However, this pure association is corrupted somewhat due to the fact that frequently there is found no immediate danger when the red or yellow signal is shown. For example, the signal will turn amber and red without the existence of cross traffic. Because of this, drivers do not associate fully the meaning caution and danger with the yellow and red signals. The red signal means to the driver chiefly that he is required by law to stop.

To determine the effectivenes of the flashing beacon "before and after" studies were made of several intersections. Accident records were made available for six intersections by the Connecticut Department of Highways, as well as speed studies made before and after the installation of a flashing beacon at one intersection. Another intersection was studied by the Virginia Department of Highways specifically to determine the effectiveness of the flashing beacon.

Locations Studied

The installation studied in Virginia was at the intersection of a major north-south through route (US 13) with a local State Highway (Va. 179), in the small crossroads town of Onley, Virginia. The signal was used in conjunction with stop signs and advisory speed signs.

All four approaches to the intersection are lined by a mixture of commercial establishments and residences. Sight distance is poor for both northbound and southbound traffic on Route 13 at the intersection, although the sight distance along Route 13 itself is over 500 feet. The posted speed limits on Route 13 are graduated from 50 to 35, then 25 on both approaches to the town, so that the posted speed limit through the intersection is 25 miles per hour. Parking is prohibited for 75 to 150 feet from the intersection on both sides of Route 13. Route 13 is a fairly heavily travelled north-south route carrying about 30% out-of-state vehicles and 33% trucks. Route 179 carries mostly local traffic and has a volume of approximately one-half that of Route 13.

The other intersection at which "before and after" field studies were conducted was at the intersection of the Wilbur Cross Highway (Conn. 15) and Mile Hill Road in Connecticut.

The Wilbur Cross Highway is a two-lane concrete road twenty-four feet wide with eight foot bituminous shoulders along both sides. Approaching the intersection eastbound, the Wilbur Cross follows a three degree curve to the right on a descending grade of three per cent. From the intersection easterly the pavement is level tangent for a distance of 1000 feet.

Mile Hill Road is a town-maintained highway crossing the Wilbur Cross at near right angles. The road is used extensively as an approach road to the Wilbur Cross by commuters to Hartford. As a result there is a substantial right turning movement westbound onto the Wilbur Cross in the morning and a left-turn movement northerly from the Wilbur Cross in the afternoon. Both throats of Mile Hill Road are channelized to allow semi-rotary movement entering or leaving Mile Hill Road.

The sight distance along the Wilbur Cross Highway is at least 1000 feet to the east of Mile Hill Road, but is restricted to 540 feet to the west by an embankment on the west approach.

The posted speed limit is 45 miles per hour on the Wilbur Cross Highway, while traffic on Mile Hill Road is required to stop before entering the Wilbur Cross Highway.

Procedure

Intersection of US 13 and Virginia 179

In Virginia the "before" study was carried out on a weekday in September 1949 and the "after" study on a weekday in January 1950, a little more than four months later. Both procedures were identical so that results of the two studies could be compared. The studies included spot speed checks on Route 13, north and south of the intersection, noting application of brakes by the driver, directional movement counts, and classification of vehicles using Route 13.

Speed Studies

Spot speed checks were obtained, using the Electro-matic Speed Meter and Esterline Angus Recorder. The recordings were obtained at points 1000, 500, 300 and 100 feet north and south of the intersection. Checks were made at each location for a period of one hour, yielding samples of from 144 to 270 observations each hour. The speeds were recorded from a vehicle parked at the curb in all cases.

This article inaugurates a renewal of a series prepared by recent graduates of the Yale Bureau of Highway Traffic and based on student research. It is the first article to be published since the July, 1950, issue and is the first from the graduating class of 1950.

Braking Study

A detectable driver reaction to conditions at an intersection is deceleration or the application of brakes by the driver. Deceleration is difficult to detect by the outside observer, but braking can be detected by the illumination of the stop light on the rear of the vehicle. This type of study is fairly reliable also, since it can be repeated with very little error attributable to individual interpretation. There may, of course, be some error due to the fact that the stop lights on some vehicles will be out of order or are not as sensitive on some vehicles as on others, but this error should be fairly equal for both "before" and "after" studies.

To make this study observation stations were set up on Route 13 at points 100, 200, and 300 feet north and south of the intersection, and marked faintly on the pavement with a chalk line. These lines were visible to the observer but not to the drivers of approaching vehicles. Observers located on the shoulders were supplied with hand denominators with which they counted those vehicles which were braked and those which were not braked within each of the 100-foot distances.

There was considerable braking, of course, because of turning vehicles, cross traffic, pedestrians, etc., but any increase in braking during the "after" study could be attributed to increased caution on the part of the drivers due to the existence of the flashing yellow light, provided that all other conditions remained comparable to the "before" study. These other conditions include both traffic (volume, composition, turning movements) and physical conditions (physical layout, pavement condition, weather, and posted speed limits).

Control Counts

To take into account any changes in traffic conditions between the two studies certain control counts were made. These included a twelve-hour classification count and a turning-movement count during both studies. Vehicles were classified as passenger cars or trucks and further classified as foreign, non-local, or local. Foreign vehicles were those bearing out-of-state license plates. Non-local vehicles were registered in the state but not in the vicinity of the study. Local vehicles were those registered in the area of the study and could be distinguished by the numbers on the license plates, since each county in the state is issued its own series of numbers. By classifying traffic in this manner it was possible to determine what proportion of the traffic was truck traffic and what proportion could be expected to be familiar or unfamiliar with the intersection.

Speed Studies

Speed of vehicles on the Wilbur Cross Highway were measured with the Electro-matic Speed Meter, the readings being recorded manually according to direction of travel.

The "before" study was made in January 1949 and the "after" study in May of the same year. Speeds to the east of the intersection in both studies were recorded for about 1½ hours between 10:45 A.M. and 12:30 P.M. Speeds to the west were measured for about the same length of time between the hours of 1:00 P.M. and 2:45 P.M.

During the "before" studies speeds were checked at points about 500 feet to the east and west of Mile Hill Road, recording separately, vehicles traveling in opposite directions. During the "after" study, however, the procedure was altered somewhat, and speeds were recorded at points 350 feet east and west of the intersection, and for vehicles approaching the intersection only. Consequently, "after" speeds of approaching vehicles 350 feet to the east and west had to be compared with "before" speeds of approaching vehicles 500 feet to the east and west of the intersection.

Analysis

The speed studies, braking studies, and accident records were analyzed separately and conclusions drawn from a consideration of the results of all the studies. The control counts were compared first so that any changes in conditions during the "before" and "after" studies might be taken into consideration.

Control Counts—Virginia Study

Comparison of volumes entering the intersection show that the total intersectional volume during the "after" study was 3900 vehicles (7:00 A.M.-7:00 P.M.) as compared with 4400 vehicles during the "before" study, a reduction of about 12%. The relative number of turning vehicles remained substantially unchanged.

The proportion of trucks to passenger cars during the two studies remained the same. Of the 2433 vehicles recorded during the "before" study 818 or 34% were trucks. During the "after" study 2585 vehicles were recorded, 869 or 34% of which were trucks.

Also remaining unchanged was the proportion of local to non-local to foreign passenger cars. The proportion of local to non-local to foreign trucks changed somewhat, there being a higher percentage of non-local trucks and a correspondingly lower percentage of local and foreign registered trucks during the "after" study. The percentage increase in non-local drivers was mostly balanced by a decrease in the

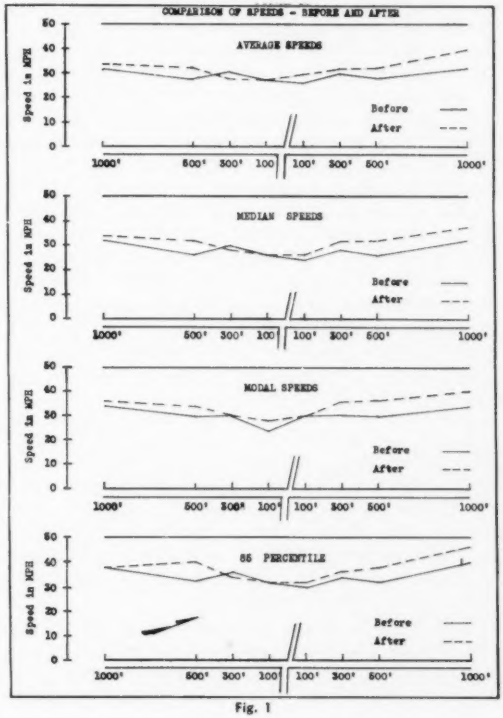


Fig. 1

per cent of foreign vehicles, there being only a 4% decrease in local truck registrations. Since both non-local and foreign drivers were assumed to be unfamiliar with the local conditions, this shift in composition of the traffic stream is deemed to have no influence on the "before" and "after" speed and braking studies.

Effect on Speed—Virginia Study

The recorded speeds on Route 13 were tabulated in two mile per hour increments, and cumulative speed curves were drawn up for each of the eight locations. For the sake of brevity, however, these curves are not included in this paper. From the tables the average, median, modal, and 85 percentile speeds were determined. These values obtained in the "after" study are compared with the values for the same location during the "before" study as shown in Figure 1.

It is interesting to note that speeds during the "after" study were consistently higher than those during the "before" study with the exception of those measured 300 feet south of Route 179. At this point the average speed during the "after" study was 2.5 miles per hour lower than the average speed during the "before" study. It should also be noted that during the "before" studies the decline in speeds approaching the intersection was irregular, the speeds at a distance of 300 feet from the intersection being slightly higher than the speeds measured at 500 feet from the intersection. During the "after" studies, however, the speeds declined more steadily approaching the intersection. Nevertheless the speeds checked nearest the intersection were slightly higher during the "after" study than during the "before" study.

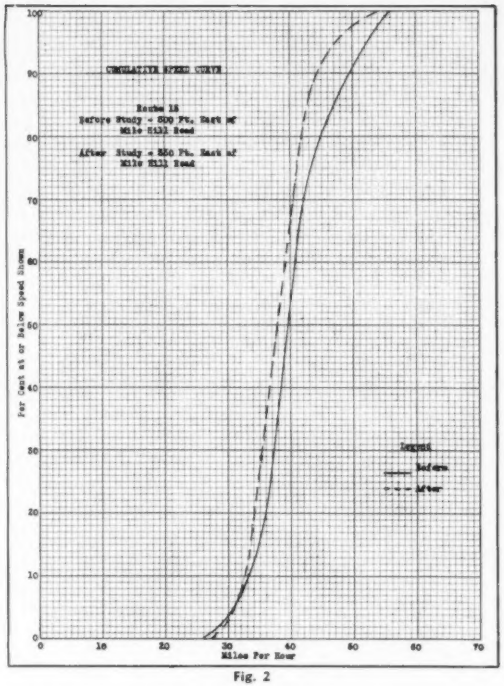
It can logically be concluded from the comparison that the flashing yellow light did *not* cause a reduction in speeds through the intersection, but may have had some psychological effect on the drivers. Manifestations of this psychological effect on the driver are not apparent on the speeds recorded through the intersection, but might possibly evidence itself in the "before" and "after" study of accidents at the intersection. The installation at this particular intersection was too recent to obtain sufficient accident data for analysis.

Effect on Speed—Connecticut Study

The intersection studied in Connecticut was in a completely different type of environment from that studied in Virginia and warrants for installing the lights were different. The intersection in Connecticut was isolated on a high speed highway and there was no roadside development, but the intersection was "blind" when approached from the west. The flashing beacon here serves to identify better the location of the intersection which otherwise would not be conspicuous to eastbound traffic.

The speeds recorded during the "after" study are compared with the speeds obtained in the "before" study in Figures 2 and 3. It was found that the average speed of eastbound vehicles before installation of the flashing beacon was 47 miles per hour compared to an average of 44 miles per hour after installation of the beacon. For westbound traffic the average speed before installation of the beacon was 50 miles per hour as compared with an average of 48.9 miles per hour following installation.

Although the average speed of vehicles approaching from both directions was lower during the "after" study, the reduction was only 3 miles per hour on the more critical side of the intersection. Even a slight reduction in speed,


Cumulative Speed Curve
Route 13
Before Study = 500 Ft. East of Mile Hill Road
After Study = 550 Ft. East of Mile Hill Road
Per Cent at or Below Speed Shown
Miles Per Hour
Legend
Before
After
Fig. 2

however, may indicate an increased alertness on the part of the drivers. The psychological effect on the driver can only be measured in terms of accident experience at the intersection.

Braking At Intersection—Virginia Study

A graphic presentation of the results of the vehicle braking study described above is shown in Figure 4. Following installation of the beacon at the intersection of US 13 and Va. 179, the per cent of drivers who applied their brakes increased by only 1% between 300 and 200 feet south of the intersection, increased by 7% between 200 and 100 feet south of the intersection, and decreased by 1% within 100 feet south of Route 179.

Approaching from the north the per cent of drivers on Route 13 applying their brakes decreased by 1% between 300 and 200 feet from the intersection, remained the same between 200 and 100 feet from the intersection, and decreased by 5% within 100 feet of the intersection following installation of the beacon.

The slight increase in braking on the south approach was not substantiated by the results obtained in the opposite direction. This would seem to indicate that the increase in braking was not substantial enough to conclude that the flashing light was responsible for the change. Furthermore there was actually a decrease in the percentage of braked vehicles within 100 feet on both sides of the intersection.

The Accident Picture

Insufficient time had elapsed since the installation of the two beacons in Virginia and Connecticut to permit a "before" and "after" analysis of accidents at these two locations. However, accident data were available on a number of other locations at which flashing beacons had been in-

stalled in the past.

The relative exposure to accidents is an important consideration when comparing "before" and "after" studies. Consequently it was felt that only years having comparatively equal traffic volumes should be compared for any particular intersection being studied. Therefore the average daily traffic volume for each intersection studied was obtained for each year covered by accident records. Volume counts were not available for every year, and wherever this was the case the volumes were estimated by expanding the known volume from a previous year. The expansion factors were obtained from counts made annually at master traffic count stations in the vicinity. Then for each location years having comparable volumes were selected, and accident records for these years only were analyzed.

Before the installation of beacons there was a total of 39 accidents reported at the six locations under study. For an equal period after the beacons were installed there were 35 accidents reported, a reduction of about 10 per cent. However, the number of accidents increased at two of these intersections and remained constant at one.

The most frequent type of accident found was the right angle collision. Next in frequency were head-on collisions. The sample size for most types of accidents was too small to draw conclusions with reference to the effect of the flashing beacons on the type of accident. However, there was a consistent reduction in the number of right angle collisions following the installation of flashing beacons at all four intersections at which angle collisions took place.

The relation of day to night accidents before and after flashing beacons were installed is shown in Table I for each intersection studied. As shown in the table the proportion of night accidents decreased substantially following installation of the beacon. That is, night accidents during the years prior to the installation of the light represented 48.6 per cent of the combined night and day accidents, while following the installation of the blinkers, night accidents represented only 30.5 per cent of the total. This, however, was not the case for each individual intersection.

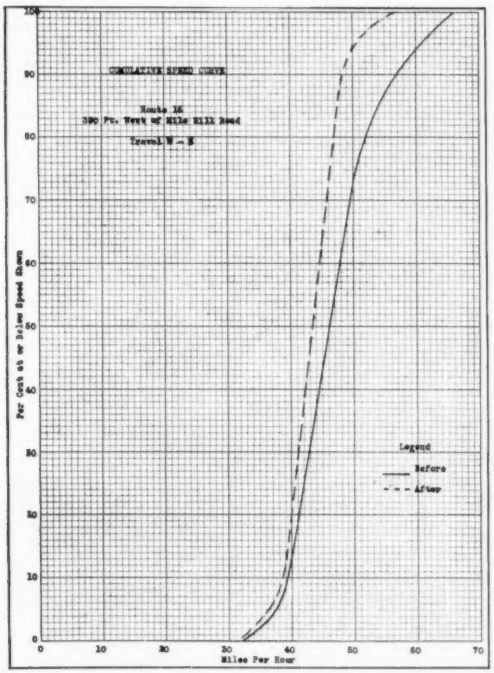


Fig. 3

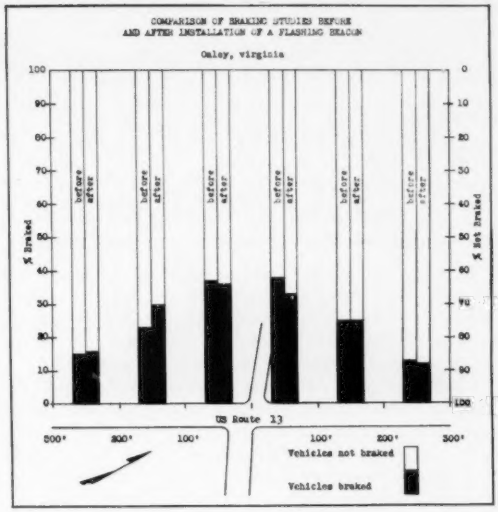


Fig. 4

Conclusions

The effectiveness of flashing beacons was studied from two standpoints:

1. As a warning device intended to make intersections safer, and
2. As a speed control device.

The effectivenes as a warning device is reflected in accident experience before and after installation. Braking and speed studies were carried out to detect any overt reaction to the flashing light as a warning device. The effectiveness as a speed control device was measured through speed studies.

Effectiveness as a Warning Device

Theoretically a flashing light is a good warning device since any flashing light attracts attention. However, the important factor is not to attract the driver's attention, but to elicit the necessary response from this attention. If the driver does not, for any reason, heed the warning conveyed, the device is ineffective. The best measure of the effectiveness of the driver's response is in accident records, for the purpose of the device is to enhance safety and prevent accidents. The accident records indicate an over-all 10% reduction in accidents for the six intersections studied. This however was not true for each intersection separately. In some cases accidents actually increased. Consequently it was concluded that the usefulness of a beacon in improving safety at intersections is definitely limited to special circumstances. Even at intersections where accidents were reduced, the beacon was only an amelioration of the existing condition and not a correction.

TABLE I

Relation of Day to Night Accidents--Before and After

Location	Before				After			
	Night	Day	% of all Acc. Night	Day	Night	Day	% of all Acc. Night	Day
Rte 5 & State St.	7	5	58.5	41.5	3	6	33.3	66.7
Rte 173 & Rd 760	6	2	75.0	25.0	1	6	11.0	89.0
Rte 68 & 69	1	8	11.0	89.0	2	6	25.0	75.0
Rte 8 & Rd 503	3	4	42.8	57.2	3	0	100.0	0.0
Rte 5A & Rte 17	1	1	50.0	50.0	2	3	33.3	66.6
Rte 6 at Green	1	0	100.0	0.0	0	1	0.0	100.0
Totals	19	20	48.6	51.4	11	25	30.5	60.5

The type of accident that occurred most frequently was the right angle collision. It is significant that this type of accident was reduced to some extent at every intersection at which they had occurred prior to the installation of the beacon. They were not eliminated entirely however.

The ratio of night to day accidents was reduced substantially following the installations. This was not true in every case, but could be due to the small number of accidents at some of the locations. It was concluded, however, that on the whole the flashing beacon is more effective during the daylight hours.

No increase in the application of brakes at or near the intersection was apparent to indicate an overt reaction to the warning conveyed by the flashing yellow light.

Some reduction in speed (1 to 3 mph) was found on the Wilbur Cross Highway at Mile Hill Road which may indicate increased caution on the part of the drivers due to the flashing light. This decrease was more prominent for the traffic approaching from the "blind" side of the intersection. Whether this is sufficient to bring about a reduction in accidents is doubtful, since a reduction in speed of only 3 mph will not eliminate the existing problem, that of insufficient time to enter, leave, or cross the traffic stream.

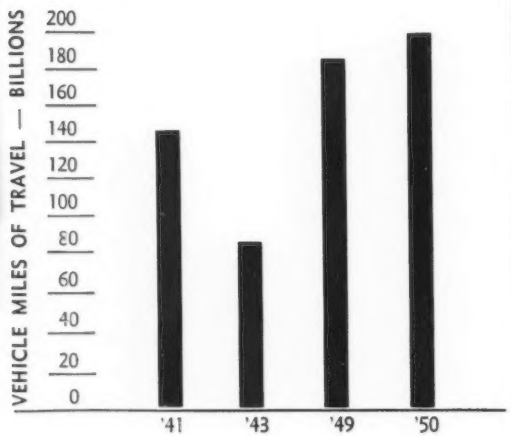
Effectiveness as a Speed Control Device

The available data from the Connecticut Highway Department show that the reduction in traffic speed was very slight following the installation of the flashing beacon.

At the intersection of U.S. 13 and Virginia 179 in Onley, Virginia, speeds increased very slightly following the installation of the beacon. Speeds checked on Route 13 at points 100, 300, 500 and 1000 feet north and south of the intersection were generally slightly higher with the exception of one point, 300 feet south of the intersection. Here the 85 percentile speed was reduced from 36 to 34 mph after the beacon was installed. Nevertheless the speed through the intersection itself was not reduced.

It is therefore concluded from the available information that flashing beacons do not bring about a significant reduction in speeds.

Traffic Trends



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Businessmen's Conference on Urban Problems - Chamber of Commerce of United States, Washington, D.C.

Financing Off-Street Parking

Statement By Theodore M. Matson, Panel Chairman
Director, Yale University Bureau of Highway Traffic

Through the courtesy of the Chamber of Commerce of the United States, "Traffic Engineering" magazine is reporting two panel discussions of interest to subscribers. The discussions will appear in consecutive issues of the magazine. A transcript of the entire conference will be published and is available at nominal cost.

INCREASINGLY and at an accelerated pace, there is a growing recognition that off-street parking facilities must be provided in business districts if accessibility to the motoring public is to be maintained and property values are to be stabilized. Failure to provide such facilities leads to illegal curb parking, vehicle cruising, and even double parking. The traffic stream thereby chokes itself, lowering accessibility to all, inducing decentralization, and destroying property and business values.

City dwellers and those who go to town are looking for leadership and guidance in finding a place to park their cars. Numerous surveys have been made indicating size and location of needed parking facilities. Technicians and builders, through study and experience, have gained the know-how of parking facility design and construction. But clear-cut policies and procedures of financing off-street parking are needed in most communities.

On framing a financial policy for off-street parking, certain questions of *who* and *how* assert themselves. Who is to venture the capital required and how is the capital to be amortized? Corollary to these questions arises determination of *who* benefits from off-street parking and to what extent, and *how* may such benefits be recouped to secure the necessary capital? Is off-street parking of such extent and nature that it is a public problem requiring governmental action? If parking space is a public utility, is public ownership or private enterprise indicated? These and other questions beg answering.

Now if the mere provision of parking space and service were a profitable enterprise in and of itself, undoubtedly private enterprise would long ago have solved our parking problems through operation of the profit motive. Assuredly in the present market of parking service, there are certain facilities which are money makers. The demand for parking service will, of course, vary with the prices charged. The cost-demand ratio of parking service is in need of analysis and study. For a given parking facility there are price levels of maximum return which yield sufficient revenue to produce satisfactory profits. The portion of the demand which is willing to pay these prices is currently being satisfied through profit motivation. The simple fact remains, however, that a major portion of lower priced parking demand goes unsatisfied. Can the price of parking be lowered? Are prices too high because of monopolistic tendencies? Can a greater volume of parking businesses produce lower prices? Are subsidies to parking service warranted?

Vehicle users are not the sole beneficiaries of parking space. No one parks for parking's sake alone. Such parking is always incurred in connection with some more basic purpose. In business districts, parking takes place so that the vehicle-user may secure goods or services which are profitable to purvey, or so that he may engage in gainful employment. Here at once are two types of parkers which will be recognized. The one class constitutes patrons and clients, the other is workers. The question then arises: Are not the merchants and employees beneficiaries of parking service?

Again, those who use the streets for travel purposes only find their passage through business areas impeded by parked vehicles, vehicles cruising for a place to park, and those which are double parked. Can it not be said that through traffic then is also a beneficiary of adequate parking facilities? And if this impedance to flow indirectly forces rerouting, more stringent regulations, lessening the accessibility of the business district and lowering property values therein, passing proportionate increase of tax burdens to other areas, is not the city as a whole a beneficiary of adequate parking space?

It seems, therefore, in framing financial and administrative policy that vehicle users, land and business owners, as well as the general street user and the city as a whole, are beneficiaries which must be recognized. The proportionate interest of each of these groups must be evaluated in each community struggling with its parking problem.

There is, of course, a wide range of financing methods

in dealing with off-street facilities. Briefly, the following sources of revenues may be considered in a given case:

1. General revenues, including property tax and use of city properties, acquired from tax sales or otherwise.
2. General obligation bonds.
3. Revenue bonds.
4. Parking revenue including revenue from meters on and off-street, concessionaires, and lessees of the parking facility.
5. Special assessments on benefited properties in proportion to benefits received.
6. Grants-in-aid.
7. Private capital especially through corporate enterprise.
8. Gifts, bequests, devices, grants, etc.
9. Combination of methods.

Through a combination of these methods of finance all beneficiaries may be tapped and in proportion to benefits derived in the particular community.

Leadership is a prime ingredient out of which progress in parking relief is made. Leadership is required to work the diverse benefitted components of the community into an active responsible agency. Buck-passing will only postpone relief and prolong the agonies of slow strangulation. This leadership will most likely and can most properly come from the land and business owners in the areas where parking is a problem. It is this group whose capital values are at stake.

The Minneapolis Parking Corporation Plan

Statement By Lyman E. Wakefield Jr.
Assistant Vice-President
First National Bank, Minneapolis, Minnesota
President, Downtown Auto Park, Inc.

SOME months ago, downtown business interests in Minneapolis, Minnesota, including retailers, banks, hotels, and building owners and managers, represented through the Minneapolis Chamber of Commerce, decided unanimously to proceed with construction of off-street parking facilities on a private ownership and operation basis. This decision was made after considering sponsorship of a municipally owned and operated off-street parking plan to build three parking decks, involving assessment against benefitted real estate or financing through the issuance of revenue bonds.

The result was the formation by business interests of a corporation, Downtown Auto Park, Inc., with a group of individuals acting as directors and officers, without salary.

This corporation has functioned quickly and efficiently with parking engineering assistance of National Garages, Inc., of Detroit, and in a period of a few months has acquired two sites, arranged for long-term mortgage financing, raised sufficient equity capital, completed engineering and architectural plans, and is now in the process of submitting finished plans to a list of contractors and asking for bids covering the construction of two off-street parking decks. These facilities will cost approximately $2 million, including cost of land, and will provide off-street parking for a total of about 1400 cars. This will mean a substantial addition to Minneapolis parking facilities, as there are now only 1,921 parking meters in the central loop area of this city. It is the feeling of business people in Minneapolis that this project should remain open-end and serve only as a beginning. It is apparent that the private ownership approach to date has resulted in rapid progress, at what probably is lower cost than could have been possible under municipal sponsorship, and will have the advantage of being privately operated and self-amortizing, while providing government with real estate and income taxes.

The Des Moines Parking Improvement Plan

Statement By Mr. N. H. Nielson
Secretary, Retail Merchants Bureau, Des Moines, Iowa, Chamber of Commerce

THE Des Moines plan for off-street parking is strictly a municipal project insofar as providing the facilities. It is the result of a long range program and the number one project set out in our post war planning. It has been the subject of continuous study and research by a most competent and interested committee of Des Moines business leaders, who for a number of years have explored every possible approach to this question of what to do about parking.

In the early stages of the committee's investigation, it seemed it was a matter for private interests to provide off-street parking for the shopping public; but upon further investigation and study, the committee came to the conclusion it was the function of the municipality rather than private business or private interests. The committee's reasoning in arriving at this conclusion was the fact that the problem is created by the public at large and not by a small segment thereof, and anything that is of public interest should be solved by the public's representative, the municipal government, rather than made the function of private business.

The reasons for which the committee felt that the municipality should provide off-street parking are:

1. Secure most desirable locations
2. Parking meter money to help finance
3. Low cost of financing
4. No real estate taxes
5. Rate of charges at a minimum

1. To be of service to the greatest number of people, the

business interests and the downtown property owners at large, it is important that any off-street parking projects be so located as to be convenient to the shopping public. Such locations are not always possible for private business to acquire as they are often tied up in estates and trusts. But the city with its power of condemnation can acquire real estate in the most desirable locations, making the facilities more attractive and used to the utmost and thereby serving business interests, property owners, and the motorist.

2. The Des Moines plan provides for the use of surplus parking meter revenues to help pay for the acquisition of such facilities. That would be impossible for private business to do, but as parking meter income is contributed by the motoring public, it seems reasonable that a portion of such revenue, which is not used for the actual maintenance of the meters, should be applied for off-street parking for the benefit of the motorists who have helped maintain meters.

3. By reason of the application of a tax levy, if needed, it is possible for the city to finance such facilities at a lower rate of interest than would be possible for private business because there is a tax levy to guarantee payment in the event that the surplus income from meters, plus the income from the facilities are inadequate to retire the bonds. In other words, the bond holders may at all times feel secure in their investment which was clearly indicated when the city of Des Moines sold $1,250,000 worth of parking bonds at an interest rate of 1¾ per cent plus a premium of $11,350. All of these reasons will be important factors in the establishment of a parking fee rate that will attract motorists.

4. By the municipality providing the facilities and placing limitations on the method of operation, it is not necessary to apply the ordinary real estate tax. This also serves to reduce operating costs. It may be argued that the city will thereby lose some income. This, however, will be more than offset by the increased business and resulting increased valuations of the property affected.

I think I should mention that in order to use parking meter money, special state legislation was necessary and enacted in the 1949 General Assembly, whereby 75 per cent of the parking meter revenue must automatically be placed in a fund to be used for the acquisition of off-street parking, if and when it is proven the need exists.

The Des Moines plan for off-street parking calls for four units accommodating 1,800 to 2,000 cars, however, it was the opinion of the committee and the city council that it would be unwise to complete the entire project at once, and so we have started with two units which are now under construction. When completed they will accommodate 750 to 800 cars at one time. One of these units is the conventional type ramp garage, consisting of basement, three floors and roof and having a floor area of 92,918 square feet. It occupies a land area of 23,232 square feet. The second unit is an innovation in the field of parking facilities, known as the Bowser Parking System. It consists of nine floors (land area of 11,550 square feet) and provides 400 individual stalls for cars, each car being brought to its stall by a combination crane and elevator. The first unit will be completed in a few weeks, the second one, early spring.

Financing Off-Street Parking in Allentown

Statement By Donald P. Miller
Park and Shop, Inc., Allentown, Pennsylvania

FIVE years ago a small group of merchants and property owners met to discuss the then-nebulous Allentown Plan for central-city parking. We envisioned a quarter-milion dollar circle of lots owned by Park and Shop, subsidized by the merchants for their customers through a ticket-validating system.

Today we own $680,000 in assets, control almost a thousand car spaces on twelve large parking lots less than 300 steps from car to counter. We park a third of a million cars a year, 15% of them validated by the stores. Projecting the plan to 1960 we can see a million dollar corporation before the real needs of the city are adequately met.

At the outset we felt that the job was primarily a municipal one, but we did not care to risk the decentralization of our magnificent shopping center while we waited for our city fathers to wake up to the problem.

A handful of us, with our local newspapers setting the pace, set up Park and Shop, Inc. We purchased several tracts of land prior to the formation of the corporation, then started selling stock to the merchants.

Merchants on the main street were assigned quotas on a basis of $1 a square foot for first floor areas. Thus a 30x100 store in a 100% location had to buy $3,000 in common stock in order to be eligible for the validation of customers' tickets. This $3,000 could be paid in cash or over a five-year period.

Remarkable cooperation by a handful of merchants made Park and Shop possible. They exceeded their stock quotas and made it possible for us to establish a sound basis of financing. The first hundred thousand was the hardest.

We went into business in July 1947 and by February 1949 had reached our quarter-million dollar limit of authorized capital.

In the fall of 1949 we had an opportunity to purchase a strategic property and increased capital to $300,000. When we decided to build a ramp, we again needed money, so the capital was increased to $500,000.

From the start of Park and Shop our local banks have been extremely cooperative by lending on our notes and mortgages. Our $400,000 capital, $350,000 of which has been paid in, is augmented by $36,000 in bank notes and $258,000 in mortgages. These have been written with monthly amortization over a 20-year period, although we plan to anticipate these payements.

In 1947 we went into business with 30 stockholders. Today we have 101. The distribution of the stocks was one long campaign of selling our dream and its value to the community.

Our most serious hurdle in financing was the general

feeling that our stock was worthless because our objective was a community enterprise and as such it was assumed we would go broke.

Our balance sheet proves how wrong they were. Many who were cool to our efforts five years ago are today our most enthusiastic stockholders and boosters. They realize that the decentralization which is destroying valuable central city areas will not destroy Allentown.

We made no fancy promises in distributing our stock. We said that we hoped to earn 4% on our money but that all earnings during the first 5 years of business would be plowed back into promotion and development.

We have been in operation three years and three months. Our last statement showed earnings of better than $1,000 a month before depreciation and interest. Our total cost of bringing the corporation into the black was $8,178 or about 2% of our subscribed capitalization. The normal figure for this type of promotion is closer to 15%. However, several of us have done all the development work, land purchasing, lot organization and stock selling without any thought of financial return.

This is the real secret of Park and Shop's success. We had a competent group of men able to put up a substantial amount of money as well as their time and effort. No one could have paid us money to do the work of the last five years. This was just as important to the community as the Red Feather Fund and we attacked the problem with this point of view.

Incidentally, our plan has had nationwide publicity and several cities have leased our name for a dollar a year. We will be glad to cooperate with any community enterprise endeavoring to improve parking conditions.

If you want to have a lot of fun, tie up all your money, make friends on the business street who are willing to work day and night for the next three years—start a Park and Shop in your city. Three men and your newspaper can do the job.

To be continued in February issue

Reference Notes

Traffic Engineering Division
Dept. of Public Works,
Norfolk, Virginia

Traffic Helps

With the thought that other cities probably have trouble informing vehicle operators who park on main thoroughfares that parking is prohibited during rush hours, we submit this solution that has proven extremely effective:

Figure 1 shows type and mounting of sign formerly used on our main thoroughfare which read "NO PARKING 7 A.M.-9:30 A.M. AND 4 P.M.-6:30 P.M., ONE HOUR PARKING 9:30 A.M.-4 P.M." These signs were placed on light poles which were approximately 150 feet apart. In addition to these signs a plate was placed on each parking meter giving legal parking hours.

Enforcement of the rush hour parking ban disclosed that the ability or desire of vehicle operators to read signs had been overestimated. Excuses in traffic court about not seeing the signs were accepted and the local automobile club cried "TRAP!"

Fig. 1

The problem then was to place enough signs to cover all loopholes. Naturally, it was not deemed practical to install a sign on a pole at each meter or for each two meters. The street had undergone a "face lifting" with new light poles and the elimination of all overhead wires and makeshift signs on each parking meter pole were definitely out.

Figure 2 shows how this problem was met. This solution has been very effective from an information, esthetic, and maintenance standpoint.

Fig. 2

TRAFFIC NEWS

IRF Affiliates Place Exhibits in Auto Shows

International Road Federation affiliates in London and Paris (British Road Federation and Union Routière de France) entered unusual exhibits in recent automobile shows in their respective countries.

The exhibit of the French affiliate in Paris depicted a new bridge over the Seine tied-in with the express highway from Paris to Le Havre and Cherbourg. The exhibit was designed to stimulate interest in construction of the bridge.

At London, the British Road Federation had a unique exhibit with miniature automobiles in motion on models of an express highway and existing national roads. The graphic presentation contrasted the easy movement of traffic on modern, high-speed roads and the slow, arduous movement of traffic on the outmoded national roads.

Proposed Western Regional Research Program Approved

A report on a proposed research program by the Western Institute Committee on Highway Policy Problems, centering around proper allocation of highway costs, was approved at the western regional meeting of the Council of State Governments in Santa Fe, October 23, 1950. The report now will be referred to the member states for consideration by individual legislatures. The report includes a prospectus of research prepared by the Institute of Transportation and Traffic Engineering of the University of California, listing some 16 items of desirable research activity relating to the tax allocation problem. In addition to endorsing the making of various state studies, the Research Subcommittee recommended establishment of a regional test road study (apparently similar to the Maryland road test) and creation of regional technical advisory committees and a regional correlation staff.

Third Missouri Traffic Engineering Conference

State highway officials took an active part in the program of the Third Annual Traffic Engineering Conference, which was held in Columbia, November 8 and 9.

P. H. Daniells, assistant chief engineer, extended greetings and best wishes to the group for an interesting and beneficial meeting.

On the second day of the session, Ben F. Leslie, division engineer at Macon, and J. G. Morgan, vice-chairman of the Commission, delivered interesting addresses on "Aims and Objectives of Today's Program" and "Traffic Problems on Rural Highways."

Leslie stressed the "Human Frailties" angle of the complex traffic problems. He urged the adoption of an adequate Drivers' License Law to help overcome the human element.

Commissioner Morgan emphasized that "Missouri's road problem must be approached as a whole, and not a problem of parts. Each type of road presents its own peculiar problem and each of these problems must be solved in relation to the whole. To neglect one is to threaten the destruction of all."

Leon Corder was the "guiding hand" of the Conference for the state highway department and took part in the panel discussion of various Traffic Engineering Problems in the Thursday afternoon session. Dr. Huber O. Croft, Dean of the College of Engineering, University of Missouri, was chairman of this panel.

Col. David Harrison, superintendent of the Highway Patrol, served on the panel Wednesday afternoon in a discussion of "Traffic Problems of Municipalities and Suggested Solutions."

City officials and outside representatives were active in the Conference. Mayors Kemp of Kansas City, and Barbarick of Springfield, were program speakers and Bruce J. Carl, executive secretary of the Municipal League, T. J. Seburn, traffic engineer of Kansas City, and Lt. Roland Schumacher, Traffic Safety Division of St. Louis Police Department, took part in panel discussions. Theodore M. Matson, director, Yale University, Bureau of Highway Traffic, discussed "Origin and Destination Surveys."

Dr. Amos J. Snider, director, Adult Education and Extension Service, University of Missouri, was one of the directing heads of the Conference.

A highlight of the Conference was the banquet Wednesday evening, with Harland Bartholomew of St. Louis as the principal speaker.

Highway News

California Voters Approve Amendment

On June 6, 1950, the California electorate approved a constitutional amendment permitting parking meter revenues to be pledged for the payment of revenue bonds issued to construct off-street parking facilities. The amendment does not make such procedure obligatory; it merely permits the pledging of revenues by local officials when it is considered desirable to do so.

Legislation previously adopted permitted use of current parking meter revenues for parking facilities but did not permit the pledging of future revenues from this source for that purpose. The amendment just adopted will facilitate the development of long-range parking programs.

The amendment as adopted, reads as follows:

"Whenever under the laws of this State or under its charter any city, county, city and county, parking authority, district or other public body is authorized to acquire or construct public parking lots, garages, or other automotive parking facilities, and for the payment of the cost of any thereof, to issue any bonds or other securities payable in whole or in part from revenues of any such parking facilities, such public body, and any other public body within the territorial area of which such public parking facilities are or will be situated, is also authorized to pledge, place a charge upon, or otherwise make available, as additional security for the payment of such securities, any or all revenues from any or all street parking meters then owned or controlled or to be acquired or

controlled by it."

This is probably the first instance where an authorization to pledge future parking meter revenues for off-street facilities has been written into a State constitution.

Privileged Parking

Privileged parking has come under heavy fire from Raleigh's city council this summer. Effective September 15th parking spaces previously reserved for doctors and taxi-cab companies were thrown open to the parking public.

Raleigh physicians, or some of them at least, protested their loss with some force. They called attention to the small number of spaces reserved for doctors in comparison with the space set aside for service stations. Attorney Allen Langston, representing the doctors, maintained that in Raleigh's downtown business district there is more than a mile and a quarter set aside for 52 service stations, an average of from 180 to 210 feet per station. To this he added that if the city's franchise bus company were limited to stops at street intersections the city would be able to lay off another 100 parking spaces. The doctors lost their appeal, but the council indicated that it was not seeking to free the doctors' spaces alone. Up for action is a proposal that would do away with all other reserved parking space in the city except loading zones. This would open up the space now reserved for local, state and federal government employees. Local merchants have been urged by their own bureau to make careful studies of the loading areas at their establishments in an effort to see if some of this space can be released voluntarily.

Recognizing that the parking problem is critical in residential areas as well as in the business district, Raleigh's council passed a second ordinance. Effective November 15 all new construction outside the downtown business district must provide off-street parking facilities according to use; for single family residences, one space would be required; multiple family residences, two spaces for every three families; retail business in one and two-story buildings, one space for every 400 square feet of sales floor area; churches, one space for every ten seats. Theaters, institutions, clubs, hospitals, hotels and industries come under similar requirements.

Popular Government
July-August 1950

Origin and Destination Survey in Philadelphia

Local travel, involving short trips, is a major problem complicating the traffic situation in the Philadelphia-Camden area, the City Planning Commission has revealed on the basis of an "origin and destination" survey conducted in association with the State Highway Department of Pennsylvania and New Jersey and the United States Bureau of Public Roads.

The survey, the largest such study ever made to analyze a metropolitan area's traffic movements, was started in June, 1947. It was a comprehensive survey of the origins and destinations of the daily travel by automobile, taxis, trucks and mass transportation facilities in Philadelphia, Camden, and the surrounding suburban areas. A total of 5,246,134 person trips is represented in the survey, which cost $250,000 to complete.

The data in the seven volume report (two of maps and graphs, five of statistics) were obtained from 216,508 "external" or roadside interviews and almost 40,000 "internal" or home interviews.

Specially trained interviewers visited the private homes, apartments, hotels and institutions selected within the survey area and obtained a record of the trips made by each member of the household on the previous day. This included trips by automobile, taxi, bus, truck, streetcar, subway and train.

To accomplish the external or roadside interviews, more than 70 interview stations were established at points on highways in Pennsylvania and New Jersey. The average weekday of the survey period, June to November, 1947, represented 1,849,900 vehicle trips, of which 1,267,810 were automobile and taxi trips and 573,090 trucks.

The data obtained consisted not only of the origin, destination and type of vehicle, but also the time of travel, purpose of the trip, number of passengers and information about intermediate stops.

These data have already been used to determine location and probable use of highways in the area. The Schuylkill Expressway and Roosevelt Boulevard Extension are two of the projects for which the data was used.

It was found that the purpose of almost 44 per cent of the automobile trips into or out of the survey area was to and from places of work, slightly more than 35 per cent for social and recreational reasons, over 7 per cent for business, more than 6 per cent for shopping, and the remaining 8 per cent for other reasons.

Only 5.4 per cent of all vehicle trips passing through the survey stations continued on without either terminating the trip or making a major stop within the area.

Thus, traffic going completely through the city is negligible in the overall Philadelphia-Camden area problem.

The highest points of traffic volume, the survey concluded, were found on North Broad Street, the Benjamin Franklin Parkway and Roosevelt Boulevard in Philadelphia, and the Delaware River Bridge and the Admiral Wilson and Crescent Boulevards in New Jersey.

HAROLD F. HAMMOND won by a "landslide" in the recent Montgomery County, Maryland, elections to County Council. Harold, a charter endorsed Republican candidate and the only one available to bridge the gap between the old and new Council, carried the greatest number of votes in the entire state for a County office.

—Chase-Statler Photo
Washington, D. C.

Harold's platform included:

Non-political conduct of all county business.

Impartial enforcement of zoning laws.

All possible support to school system.

Public hearings on all major county issues.

Operation of county fiscal affairs according to sound business principles.

Mr. Hammond has the distinction of being one of the first members of the Institute of Traffic Engineers to enter politics and win an election with such an overwhelming majority.

Driver Education Films

A new, comprehensive and correlated series of motion pictures and slide films on driver education for use in high schools throughout the country has been produced by General Motors, with the counsel of the National Commission on Safety Education of the National Education Association.

General Motors and the National Education Association designed the series, first of its kind ever produced, to help fill a long standing need for high schools for good auto-visual materials on driver education. Educational authorities who have previewed the films say that they will greatly facilitate the presentation of effective instruction in this important subject.

The films also were designed to meet specifications developed last year by the National Council on High School Driver Education and thus are specially suited to the instruction of high school students. A special committee of teachers, school administrators and specialists on audio-visual instruction materials, appointed by the National Education Association, provided counsel on all phases of the project. Technical guidance also was furnished by leading automotive and traffic control authorities. The films offer a valuable supplement to other driver instruction methods, adding clarity and interest by bringing into the classroom visual situations which are difficult or impossible to provide by any other means.

The series includes three motion and twelve slide films. It covers all important points involved in operating an automobile. Each film is an instruction unit which provides specific coverage of a single topic. This assures easy and effective integration of the series into any high school's plan. General areas of instruction covered include driver qualifications, functioning and care of the automobile, basic driving techniques, rules of the road and advance driving skills.

Motion pictures are 16mm., black and white, sound films, with running times ranging from 11 to 17 minutes. Slide films are 35mm., black and white, silent films, averaging about sixty frames each. A booklet containing descriptions of the films and suggestions on presentation methods is provided for instructors' guidance.

The films may be purchased at a price of $69.75 for the complete series. This represents only the cost of prints, as General Motors has underwritten all production costs. Orders should be submitted to General Motors Photographic, General Motors Building, Detroit 2, Michigan.

Those wishing to preview the films should communicate with their state education department. General Motors has donated a set of the films to this department in each state.

Driving phases covered by the series are "Your Permit to Drive," which is introductory; "Driving Economically," "Driver Fitness and Attitude," "Switches, Instruments and Controls," "Preventive Maintenance," "Road Emergencies," "Starting the Car," "Controlling the Car," "Driving Straight Ahead," "Turning," "Speed Control," "Intersection Controls," "Parking," "In Case of Accident" and "Practice Makes Perfect Drivers." The first, second and last are motion picture films, while the remainder are slide films.

A majority of the frames of the motion and slide films are actual photographs. They are interspersed with some diagrams, and an occasional cartoon to illustrate a point.

The above photograph depicts new painted island on State Street, Route 5, through Schenectady, N. Y. The island shown has proven very effective. It is in the true center of the roadway for only a short distance. The beginning of the island at Nott Terrace (foreground) gives a 4 and 2-lane arrangement, while the end of the island at Lafayette Street (background) gives a 4 and 3-lane arrangement in the opposite direction.

Photo contributed by Tony Carrothers,
Associate Editor, "Traffic Engineering"
City Traffic Engineer of Schenectady, N. Y.

Road Signs

The chairman of the Vermont Highway Board announced that all privately owned signs will be strictly excluded from the highway right-of-way in the future. The Highway Department plans to make a survey of all privately owned signs now inside the state highway limits. Owners will be given adequate notice to relocate such signs.

"Traffic Engineering" Receives International Recognition

Word has been received from the Netherlands Transport Institute that "Traffic Engineering" magazine will be announced in their new publication entitled "Transport Documentation."

The purpose of this new monthly publication is to serve public services, science and industry by epitomizing the important articles published in the principal reviews on transport throughout the world.

A series of 1,000 abstracts from these important articles will be delivered in about ten monthly installments.

New Appointment

DAVID F. DABNEY assumed his new duties as City Traffic Engineer for Albuquerque, New Mexico, on December 1, 1950. Dave's appointment is one of the first results of recommendations made after a recent comprehensive survey of the city which was reported in the August issue, page 442. Dave graduated with a B. S. in Civil Engineering from Virginia Polytechnic Institute in

1940 and was a member of the class of 1946-47 at the Yale Bureau of Highway Traffic. After an all too-brief career as Junior Traffic Engineer for the Louisiana Highway Department, Dave was called to active duty in the United States Coast Guard, returning to inactive status in November 1945.

Prior to entering the Yale Bureau, he was on highway location for the Mexico Highway Department. Since June 1947, Dave has held the position of Assistant Traffic Engineer for the City of New Orleans.

SECTION NEWS

Michigan Section

On October 25, 1950, the Michigan Section of the ITE held a meeting at the Reo Clubhouse in Lansing. Forty-five members and guests were in attendance. Most of those present arrived early and enjoyed the pre-dinner "refreshments" provided by our genial host—Paul Underhill. Fred Eggan was in charge of arrangements and the program for the meeting.

After the dinner, a short business meeting was held at which time President Bauerle announced Joe Wehmeyer's election to the national Board of Direction. Joe thanked the group for their efforts in his behalf and discussed the desirability of those qualified transferring to a full membership in ITE. The president announced his appointment of Fred Meno to represent the Michigan Section in the Affiliate Councils of the Engineering Society of Detroit. Mr. Meno discussed the action of the council to date in regard to the forthcoming festival for Detroit's 150th Birthday Celebration. Vice-President Gibson announced the date of the next meeting which will be held in Detroit and future meetings to be held in Ann Arbor, Grand Rapids and Lansing.

Mr. Harold Brunvand, Design Engineer, Michigan State Highway Department, was the speaker of the evening. He showed colored slides and movies and gave a very interesting discussion of his recent trip to Norway. All present will attest to Mr. Brunvand's ability with a camera in extolling the beauty of this picturesque country. Although Norway is primarily dependent on its waterways for transportation it does have a considerable mileage of "roads." These roads are narrow and winding and resemble the type of roads that might have prevailed in our western mountainous areas prior to the advent of the automobile. In spite of the many treacherous turns, there were warning signs on only the most perilous. Turnouts are provided at various locations for passing; however, the buses are so scheduled as to pass in the villages. Mr. Brunvand said that there are excellent opportunities in Norway for traffic engineers, particularly in Oslo where the traffic weaves in and out with little, if any, apparent order. It was also interesting to note that there were signs in Oslo indicating parking areas, rather than no parking signs. Mr. Brunvand also pointed out that for anyone wishing to teach in a foreign country there are several remunerative scholarships available. Age is not a factor.

Respectfully Submitted,
A. C. Sherman,
Secretary-Treasurer

New England Section

The New England Section held its first meeting of the season on October 24, 1950 at the Tivoli Restaurant in New Haven, Connecticut. The total attendance of 59 was considerably enhanced by the presence of 33 members of the Yale Student Chapter, ITE.

Robert Mitchell, President, called on Dave Johnson, Senior Delegate to the Connecticut Technical Council, for a report on their recent meeting. Dave announced that the Council is sponsoring a refresher course for those of the member associations who wish to prepare for the Professional Engineers Exam to be given in the spring of 1951.

Bob Holmes, program director for the meeting, introduced the guest speaker, Mr. Matthew Sielski, Traffic Engineer for the Chicago Motor Club. Mr. Sielski delivered a very interesting talk on the Chicago Motor Club's efforts to hasten the improvement of the principal highways in Illinois. The program, supported by the Chicago Motor Club, was developed after consultation and engineering analysis involving traffic volume counts, accident experience, and road conditions. The plan supports a network of 3,000 miles of rural highways which carry an average daily volume of 2,690 vehicles. The highways in the system, half of which are in the National System of Interstate Highways, constitute 28% of the total miles of rural primary highways in the State and carry 52.3% of all the traffic on the primary system. Although it comprises only 2.6% of all rural roads in the State, this 3,000-mile system presently carries 39.2% of all rural traffic, and accounts for 39% of all rural accidents.

In order to finance the early construction of this "most-needed" network of principal highways, the Chicago Motor Club favors a 2c per gallon increase in the state gasoline tax, all proceeds of this 2c increase to be earmarked for the special 3,000-mile system, all of which is eligible for Federal Aid.

Mr. Sielski illustrated his discussion with a series of very nice Kodachrome slides showing the present poor condition of many main highways in Illinois and contrasted these poor thoroughfares with slides showing the few modernized sections of roadway that have recently been built or are under construction.

At the conclusion of his talk Mr. Sielski was bombarded with questions from the floor.

Respectfully Submitted,
F. Houston Wynn,
Secretary-Treasurer

MEMBERSHIP INFORMATION
may be obtained by writing to:
Executive Secretary
Institute of Traffic Engineers
Strathcona Hall
New Haven 11, Connecticut

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For complete information send for Bulletin #506.

Wald Industries Inc.

Wald Industries Inc.

MONTGOMERY, PA.

Secretary's Column

Now that the Annual Report of your Executive Secretary has been published, we can once again return to our regular "column" with its assorted items of news, commentary and counsel.

First, we would like to invite your attention to the editorials each month under the heading "Frankly Speaking." Members of the Board of Direction are making a valuable contribution to the traffic engineering profession and the *Institute* through these carefully-phased statements. It should be obvious to all members and subscribers that much thought and effort is back of each editorial. It behooves all of us to study them and enrich our personal knowledge of the contributions we can make on behalf of the organization and the profession it serves.

Since the theme of this month's column has been set we will continue the trend of thought by resorting to a little plagiarism. When Dr. Walter A. Cutter, Assistant Director of New York University's Center For Safety Education, assumed chairmanship of the Metropolitan Chapter, A.S.S.E., certain remarks were addressed to the membership that bear repetition. We have substituted the word *Institute* for "Chapter" and quote as follows:

"It is customary at any year's beginning to make certain ceremonial remarks We look to the past and we look to the future. We should also appraise the present. Too often we live in the past which usually looks better, or to the future which we hope vaguely will be better.

We are where we are as an organization because many good men have worked, planned and given of themselves. We have entered into their harvest. We look to the future with hope and confidence. But the shape of the future is largely decided by what we are doing and thinking today. Today is yesterday's future! What of the present? Like you, I am intensely interested in the *Institute,* not as a pleasant luncheon club, although that is good, but as an organized and progressive expression of the long march of our profession to maturity. There are certain factors in our profession which could be improved. These are: performance standards, standards of excellence, professional status and an intelligently standardized educational program. It is highly encouraging to report that there is good and healthy progress all along the line.

We look to our responsibilities and a fair question to ask ourselves is 'What kind of a society would this be if every member did as I do?' Here we find the grounds for noting the things we can do.

We can prize our membership. We can justify our membership by asking 'What will I mean to it?' instead of 'What will it mean to me?' We can attend meetings regularly and know our fellow members. We can support the committees which do much of the work of the *Institute.* Also, we can make suggestions for the betterment of the *Institute.*

We can *use* the magazine. The editor's life is not a happy one. It can be and you can help make it. Whatever you hear or do that is newsworthy is of interest to him. If you speak anywhere, hear of any developments, use special techniques, or hear of any, tell him. Let us make the magazine useful, influential and enjoyable!

Join in the efforts for the improvement of our profession. There are basically four factors which will influence our professional standing: preparation, performance, attitude and improvement. We should never neglect an oportunity to deepen our knowledge, enlarge our horizons, and increase our usefulness. Professionalism can be static, selfish, satisfied and stupid. Or, it can be intelligent, progressive and accomplishing.

We will get whatever we work for! There is no magic. There is nothing but hard work, but it is rewarding work. As the *Institute* profits in professional standing, based on solid accomplishment, so do we all. Let us put our shoulders to the wheel."

The above statement very aptly expresses our personal views on the subject.

Robert S. Holmes

Army Takes Control

Lt. Col. Charles G. Beckenbach (Member, ITE) was recently assigned by the President of the Norfolk and Western Railway to assist in the operation of the four railroads in the Pocahontas region. Charlie served a very short "hitch" at Roanoke and is back on duty at his regular post at Fort Eustis.

Yearbook Changes

ABBOTT, WILLIAM R., JR. (Assoc.)
25 Crest Road
Piedmont 11, California

BAUMEL, EDWARD J. (Assoc.)
5413 Yellow Springs Road
La Grange, Illinois

BECKENBACH, LT. COL. CHARLES G. (Member)
Hq. & Hq. Co.
9th T. Highway Trans. Gp.
Fort Eustis, Virginia

BRANIGAN, DANIEL A. (Member)
922 Stanford Street
Santa Monica, California

HARRIS, WELTON W. (Assoc.)
Vice-President & General Manager
Indianapolis Railways, Inc.
901 Traction Terminal Building
Indianapolis 4, Indiana

HOFER, VICTOR G. (Member)
6108 North Glenwood Avenue
Chicago 40, Illinois

HOFFMAN, PAUL G. (Honorary)
President
Ford Foundation
Dearborn, Michigan

KAMY, HARRY D. (Junior)
Lt. Col., U. S. Army
Port Whittier
APO 987, c/o Postmaster
Seattle, Washington

KLAR, HERBERT J. (Assoc.)
23 Park Avenue
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Longest Four-Lane Rubber Highway on Boston Post Road Opened to Traffic

A report from Massachusetts and carried in the September 4, 1950, issue of Transport Topics gives information on the use of rubber in resurfacing a project on the old Boston Post Road, now U. S. Route 1. In part it stated:

"A 5½-mile, four-lane 'rubber' highway, claimed to be the longest in the world, was formally opened to traffic recently by Commissioner of Public Works William F. Callahan, and other state highway officials. Heretofore, the use of rubber in roads has been limited to test sections ranging from 100 feet to 1½ miles.

"The new 'rubber' highway is on the old Boston Post Road, now U. S. Route 1. It extends from North Attleboro, Massachusetts, to the Rhode Island line. It was laid over an old and badly patched concrete base at an approximate cost of $200,000 and is constructed of a combination of asphalt and a new meltable rubber compound called Surfa-Sealz, developed by United States Rubber Company.

"Highway officials expect it to give at least twice as much wear as standard asphalt re-surfacing material. They hope it will virtually eliminate maintenance costs which were running as high as $1000 per year per mile.

"For several years now the Commonwealth has been experimenting with rubber as a means of reducing heavy maintenance costs on its highways," Mr. Callahan said in commenting on the new road.

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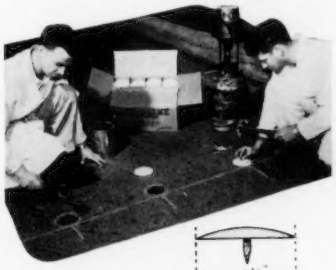

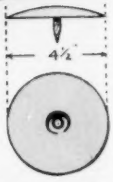

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Personality Sketch

CHARLES H. REX failed to include the details of his early life when we "needled" him into providing us with a biographical sketch. However, the records show he was born in Lexington, Missouri, in 1903. His early scholastic activities involved several schools in Amarillo, Texas; Denver, Colorado; and Kansas City, Missouri. He finally settled at the University of Illinois where he received his B.S.E.E. degree in 1926.

It seems that Charlie had a strange affinity for the General Electric Company. He officially began his career with GE one month after graduation and is still going strong after 24 years of service. Almost from the start, he plunged into specialized training in the street lighting and traffic signal field. One of his early assignments was the layout of signals and timing diagrams for a progressive traffic control system in the City of Boston.

Charlie apparently took to street lighting "like a duck to water," as he has devoted most of his time to illuminating engineering development. His experience includes many surveys and recommendations for modernization of street lighting in hundreds of communities in central and eastern United States. This work has brought him in direct contact with architects, consulting engineers, city, county, state and public utility engineers and officials, and a large portion of the ITE membership.

During World War II, Charlie was working out of Chicago and was appointed member of the Organization of Techniques for Blackout and Camouflage, Office of Civilian Defense, Chicago Metropolitan Area. He was constantly in demand for consultation on illumination for night work and protection of middlewestern defense plants.

Charlie is currently involved in design and development engineering problems at GE's big plant in Lynn, Massachusetts. Special assignments involved equipment requested by the Armed Services, floodlighting, traffic control, and street and highway lighting equipment. Design work has been pointed toward new developments for increased public safety, comfort, convenience and economy.

Since his election to membership in the ITE in 1932, Charlie has been active in many of its affairs. He has been a standing member of the Committee on Traffic Signals and Street and Highway Lighting since its inception, and has served on several important Institute administrative committees. He assisted in the preparation of certain portions of the "Traffic Engineering Handbook" text dealing with traffic signal and street lighting matters. He has also prepared and presented several papers for presentation at annual meetings and later publication in Proceedings.

In addition to his affiliation with the Institute, he has been a member of the Illuminating Engineering Society since 1930 and is currently a member of the National Society of Professional Engineers.

We have a clue to one of his hobbies by the fact that he continues to receive an annual invitation from the "F & F" Club for a little "piscatorial effort" in northern Wisconsin. He states that he has had little time for fishing in the New England area. A clue to his "other" hobby was brought to light when he mentioned a nice little sailboat moored in Marblehead harbor. The entire family—Charlie, Alice and the four children ranging in age from five to thirteen years—are enthusiastic sailing fans.

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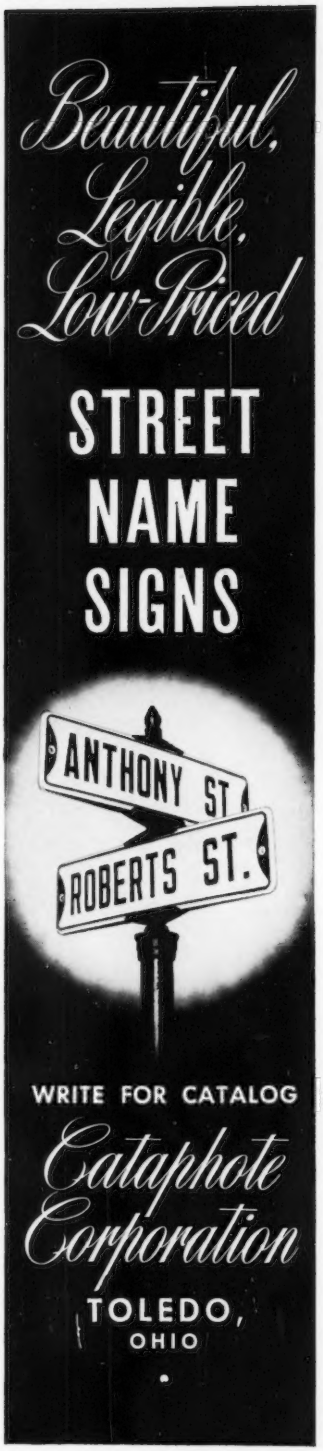

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Specific features of the *new* Wald "REFLECTO-LINER": channel and tubular steel anti-vibration frame; pneumatic and zero pressure wheels, puncture proof front tire; Hi-speed, 6 H.P. air-cooled gas engine, that purrs not races with heaviest striping materials, operates 2 to 5 MPH; ribbed drivers insure positive drive; compressor (large) 12.5 cu. ft., handles thinnest traffic paint to thickest compound; tank—12 gal. supply—wide mouth (5.75 in.); strainers in paint line for easy removal of foreign matter; spray gun—hi-capacity producing uniform cross distribution. "Nu-Matic" design minimizes replacement parts; engineered for easy maneuverability, especially when reflective coatings are used.

The "REFLECTO-LINER", Model 12, has been tested by the Prismo Laboratories, Huntingdon, Pa. and found to be in accordance with these claims.

For complete information send for Bulletin # 507.

Wald Industries Inc.

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LOOKING AHEAD

MARCH 4-6, 1951—BIRMINGHAM, ALABAMA
Twelfth Annual Southern Safety Conference. Tutwiler Hotel. Contact: Braxton B. Carr, Executive Secretary, Southern Safety Conference, 2120 First Avenue, N., Birmingham 3, Alabama.

APRIL 3-6, 1951—NEW YORK, N. Y.
Twenty-first Annual Greater New York Safety Convention and Exposition. Hotels Statler and Governor Clinton. Contact: Paul F. Stricker, Executive Vice-President, Greater New York Safety Council, Inc., 60 East 42nd Street, New York 17, N. Y.

JUNE 4-8, 1951—CHICAGO, ILLINOIS
Midwest Safety Conference. Congress Hotel. Contact: Joseph F. Stech, Manager, Greater Chicago Safety Council, Suite 805, 10 North Clark Street, Chicago 2, Illinois.

Kerrigan Weldforged Lighting Standards

The "before and after" photographs of the new Miami Beach street lighting installation tell a graphic story of how Kerrigan's tall, tapered WELDFORGED Street Lighting Standards weathered Miami's worst hurricane since 1926.

The "before" pictures had just been taken for publicity and advertising purposes when the hurricane flags were hoisted (some of the standards had never been lighted, because the installation itself had just been completed and some of the city's electrical installations had not). Kerrigan's advertising and publicity, featuring the Miami Beach installation, were held up pending the outcome of the big blow. Then as soon as possible photographers were sent to the scene to photograph the results.

Before

After

In the meantime the City Engineers had sent their congratulations. All along the beach wreckage of almost every kind littered the streets (trees were uprooted; large electrical signs were down; fancy old-style lighting standards were broken, and leaning; huge transformers fallen; refrigerators which had been blown through the walls of houses lying in the street). But the Kerrigan Standards came through as sturdy and staunch as Kerrigan had predicted they would. During manufacture they had been subjected to the highest *lighting* and *engineering* tests; and in *nature's* severest test they proved themselves equal to the strain.

The Kerrigan Street Lighting Standards are manufactured by Kerrigan Iron Works, Inc., Nashville, Tennessee. Their *WELDFORGED* method of manufacture is an exclusive process with the company.

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CORRECTION
Zoning for Parking Facilities

November issue, "Traffic Engineering" magazine, page 63, paragraph three, first line, should have read: "Of the mid-western states in which cities have made *no* use of the zoning ordinance . . "

MARK-TIME PARKING METERS prove BEST for the best INTERESTS of your Community

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Common sense in public relations . . .

Mark-Time meters please the public because they give honest time with far less chance of jamming or breakdown. They are ruggedly constructed and safety protected against chiselers and vandals. The parker HIMSELF controls the operation and knows that he will always get the right time for his money.

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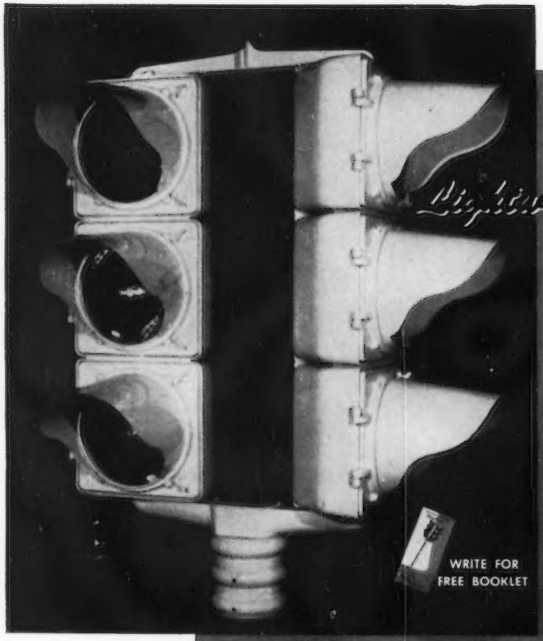

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